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Harm Reduction for Esports: Education for Online Communities

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Abstract

The significant rise of enhancement drug use in the form of stimulants (adderall) and performance-enhancing drugs (anabolic steroids) and other psychoactive substances (nootropics and or cognitive enhancers) is a well-documented phenomenon, particularly among the younger generation and is now appearing within esports. Concurrently, esports continue to increase across competitive and social domains of gaming. Alongside this growth, we have seen a shift to anti-doping promotion in games and tournaments to counteract both 'traditional' and 'digital' doping. However, there needs to be a further strand of education to go alongside these efforts to be directed into schools, colleges, universities and esport facilities to fully support and protect the health of our esport athletes. This health promotion is in the form of "*harm reduction*" by reducing the stigma around drug use and encouraging individuals to reduce risk by using 'safer use' strategies. This narrative review will go into the different types of esports and how there are different drugs that can enhance performance across a range of settings (recreational and competitive). It will then explain the risks for potential harm from enhancement drugs, the benefits of a harm reduction approach, and recommendations to promote more positive health and social outcomes to the esports community.

Keywords:

Harm Reduction, Performance Enhancing Drugs (PEDs), Education; Esports

Highlights:

- There is an online risk environment being facilitated by the normalisation of cheating online discussions around the use of these drugs for video game performance.
- This helps to promote a "dopogenic" setting for widespread PED use across multiple esports and virtual sports.
- Therefore, promoting an educational pathway to reduce harm is needed to proactively educate athletes on the risks and dangers of using these drugs.

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- Ultimately, an education and harm reduction approach will benefit the player's health and promote a cleaner, healthier, safer culture of esports.

Introduction

Esports can be simply explained as organised video game competitions [1] and can fit any category of gaming genre and is cross-platform (e.g., computer, console and or mobile phone). Esports in this paper are referred to as the most common form of gaming and include popular titles such as StarCraft 2, League of Legends (LOL) and DOTA 2 [2]. These are sedentary in nature and require little physical activity to compete in them. Within sedentary games are sedentary sport video games (SSVGs), or video games that replicate physical sports but without the physical activity [3]. Examples include FIFA, NBA 2k and EA Sports Golf.

Virtual sports can be defined as mixed reality sports games using interactive peripheral sport equipment [4]. Virtual sports are seen as an extension of an existing sport, but it is enhanced or mediated through technology and not solely reliant on virtual reality [4]. An example of a virtual sport is cycling esports (or known as e-cycling) [5]. Additional virtual sports can include sailing [6], rowing [7], taekwondo [8] and triathlon [9]. For simplicity we will categorise esports into two categories.

- Sedentary Esports - any game that requires no physical activity or movement and encapsulates SSVGs and or traditional esports.
- Movement Based Esports - any game that requires physical activity and encapsulates MBVGs, exergames and/or virtual sports.

The type of esports engagement shapes patterns of substance use and associated risks. Harm reduction refers to a public health approach aimed at reducing the adverse consequences of drug use through pragmatic, non-judgemental interventions that do not require abstinence [10]. While this approach is well established in conventional alcohol and other drug (AOD) contexts, it is largely absent in esports. As the esports sector expands, so does the documented use of stimulants, cognitive enhancers, and appearance- or performance-enhancing drugs (PEDs). These substances are often used to extend play duration, heighten focus, reduce fatigue, or enhance physique. Few mechanisms currently exist within esports for education, early intervention, or health promotion. Applying harm reduction principles to this setting would include low-threshold health services, peer-led strategies, and targeted education designed specifically for esports participants. These measures would respond to emerging patterns of drug use while respecting the cultural and competitive norms of esports environments.

For the purpose of this narrative review the aim will be to offer a harm reduction perspective to the esports community regarding the rising drug use in its various formats. This will be underpinned by the following objectives;

- Exploring the various legal supplements and illegal PEDs and advantage-seeking in esports
- To examine the perspectives of broader stakeholder groups, including anti-doping organisations and the wider esports community, particularly regarding potential conflicts or challenges.
- To examine how the unregulated, digital nature of esports creates unique challenges for applying harm reduction principles, including issues of access, enforcement, and anonymity.

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The Rise of PEDs in Esports: Normalising the Harm

PEDs are not a unique phenomenon in esports and have been well documented [11 – 14]. It is essential to define what we mean by performance enhancement within esports and how this relates to 'doping'. As written by the World Anti-Doping Agency (WADA) doping can be defined as "the occurrence of one or more of the anti-doping rule violations set forth in Article 2.1 through Article 2.11 of the Code" [15]. Doping in this context is the use of a PED that is banned or not allowed during a competition. Digital doping, e-doping and or cyber doping is digitally enhancing one's performance through software or hardware modifications [16 - 17]. For instance, these have both been reported within cycling esports [18 – 19] with 28% of competitive cyclists willing to take drugs to enhance their performance (without the risk of dying) from a sample of 366 cyclists as report by Dyer and Richardson [20]. For this paper it is the physical forms of doping that will be investigated in esports.

The popularisation of PED use in esports and video games stems from a broader issue of the normalisation of cheating. Richardson [21] outlines these various methods and also highlights that cheating is not always viewed as inherently immoral when utilised in the right contexts. For many, it is used for career development towards roles in ethical hacking or cyber security [22 – 23]. Yet, there are many reported cases that gamers are frustrated with cheating and how it needs to be improved [24 – 25]. This is then further evidenced by governance issues for anti-doping [15 & 26] and issues of drug use within esports itself [27 – 28]. There have been many examples of doping across both sedentary-based and movement based esports with the former being the more popular of the two.

Sedentary Esports

Richardson [15] highlights stimulant use in esports, explaining stimulants and 'study drugs' being used, which are commonly "amphetamines like Adderall that are prescribed to treat Attention Deficit Hyperactivity Disorder (ADHD)" [11 & 13], though may also include non-amphetamine CNS stimulants like Modafinil. There are seven named players who have been sanctioned for using these drugs across the following esport titles; CS:GO, Dota 2, Overwatch, Call of Duty, Halo and Fortnite between 2015 - 2020 [21].

Friehs et al., [29] investigated community perspectives on PEDs within competitive gaming and esports. They explored the perceptions of food, food supplements, non-medical use of prescription drugs, drugs with varying levels of social acceptance (alcohol, nicotine psychedelics, opioids) and non-invasive brain stimulation. They recruited 664 participants from an online survey and evidenced that players are willing to use or are already currently using enhancers to increase their performance in-game. This is further supported by Schubert et al., [27] who surveyed 1443 League of Legends players to estimate 12 -month prevalence of non-medical prescription drug use. 6.8% of the sample reported non-medical use of prescription drugs and 62.3% believe such substances are used occasionally and almost one third view this drug use as legitimate in esports. However, the majority agree with stricter regulation for the competitive esports landscape. .

The work here was supported by a follow-up publication [28] on the same sample from Friehs et al., [29] which revealed four key themes. I) Risk, II) Morality, III) Enhancer effects and IV) regulation. The work recommended that to increase acceptance and perceived legitimacy in decision making, regulators and stakeholders need to be involved in the decision making process when developing transparent rules and regulations for tournaments. The authors note that this will help contribute toward addressing the fragmented regulatory landscape.

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Movement Based Esports

Richardson et al., [5] in their study asked members of the e-cycling community about their perceptions of cheating and doping. A total of 337 females and 1130 males completed an online survey in 2021. 44% percent of the sample had experienced cheating during e-racing, while 87% of the sample were in favour of stronger enforcements to ban cheaters across cycling esports. In the same paper the authors discuss the use of other PEDs such as androgenic anabolic steroids (AAS) [30], that are used for a range of medical procedures but primarily utilised to promote muscle growth. Richardson et al., 2023 refer to the first case of a cycling esports athlete who competed across both traditional cycling and virtual cycling who was caught for an anabolic steroid after being tested at an in-person event [31].

Esports and Anabolics: An (un)expected crossover?

Lastly, the most recent case of doping within an esports event was the Tekken esports player representing Pakistan (Arslan Siddiqui). He was sanctioned with a two-year period of ineligibility after testing positive for stanozolol and metandienone metabolites (forms of AAS) [32]. This case is distinct, as he was not using stimulant drugs to enhance performance, but was caught using AAS in a sedentary-based event. Whilst these drugs might be expected to appear under cycling esports, for which they offer a clear advantage, in a fighting game tournament they are unlikely to improve video game performance. It is therefore important to highlight this instance, as there may be cases of drugs appearing in athletes' samples that may not hold any benefit or application to their esport. This esport player in this case was using these drugs for personal reasons to enhance his body image and fitness rather than to '*smash the buttons down faster*' but still was caught for a banned substance.

In the contexts of increasing PED use for aesthetic and lifestyle purposes among young people and gym-going populations more broadly [33], which notably has been specifically documented in South Asia [34], esports organisers should also be aware of potential drug use and harms from substances that are not being taken directly to improve an athlete's tournament performance. Moving away from different types of esports where doping can occur, there is also the use of enhancement products which may be deemed legal but are heavily contested.

Licit or Illicit Enhancements? Energy Drinks and Nootropics

To Drink or not to Drink? Energy Drinks as PED Debate

Notably, there is a frequent and consistent level of marketing and promotion of food and beverages to the esport landscape. This ranges from snacks and sugary drinks [35], alcoholic drinks [36] and energy drinks [37]. They are also shown and promoted through the use of live stream platforms such as Twitch which is promoting the association of energy drinks and unhealthy foods with elite esports and or competitive gaming to adolescents and susceptible youths [35].

Long et al., [37] performed a content analysis across the top ten esports events and leagues between January 2021 to December 2021. Across these teams and leagues 90 unique food and beverage brands were identified and a total of 497 sponsorships were found and categorised. The top three categories included the following; Energy drink brands had the largest number of sponsorships with 36.4% (n = 181), followed by restaurants with 17.3% (n = 86), then candy and snacks with 12.8% (n = 64). Unpacking the energy drink brands, the top brands providing sponsorships within the sample was Monster Energy (n = 47) then Red Bull (n = 42) and lastly G Fuel (n = 27). This was the first study to describe and analyse the food and beverage marketing within esports and highlights the saturation of energy drink sponsorships across this entertainment domain.

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The ethics of marketing energy drinks within esports and video games has been discussed by Lopez Frias [38]. Within Frias' paper, it is noted that scholars have referred to the consumption of energy drinks as "neuro-doping" [39] and that the marketing of these energy drinks to young gamers is inherently unethical. This is because energy-drink marketing practices aim to exploit children's and teenagers' vulnerability by targeting the gaming community.

Not only are energy drinks popular by their sponsorship, their marketing has helped to promote their popularity and prevalence among the esport and video game communities. Roscoe et al., [40] investigated energy drink consumption, marketing and the associated perceptions. A sample of 103 video gamers, of which 68.9% identified as male, 30.1% as female and 1% as other (mean age of sample = 31.8 years). These participants stated they consumed energy drinks and were recruited through online discord and email, completed both a survey and an interview. A correlation analysis was performed and found that the frequency of energy drink exposure on advertisement streaming and sponsorship in video gaming is positively correlated with the participants' brand preference (at 0.01 significance). Furthermore, it was found that the frequency of exposure to energy drink advertisements and energy drink sponsorship had a positive effect on the purchasing likelihood of featured energy drink products (at both 0.05 and 0.01 significances).

The authors noted that there is a concern surrounding the normalisation of energy drink consumption among the video game communities despite the known health risks (e.g., cardiovascular strain). This is further undermined by the misleading health claims these energy drink brands promote. They propose a stronger regulatory approach and public health campaigns to promote harm reduction and minimise the harm to energy drink abuse or misuse within video games [40].

There has been debate between academics if energy drinks are an illicit substance when considering the anti-doping position in esports between Lopez Frias [41] and Tweedie [42]. However, this has not transpired into real-world policy change from any esports organisation or from WADA itself or the Esports Integrity Commission (ESIC) influencing esport events. Energy drinks often contain significant amounts of caffeine, and WADA previously banned high caffeine consumption under their in-competition testing rules. However, this policy was later relaxed, with caffeine downgraded to the 'monitoring list' in 2004, despite its proven performance-enhancing effects and increasing use [43]. Whilst not actively prohibited in tournaments, from a harm reduction perspective that does not simply classify substance use as 'prohibited' or 'non-prohibited', the prevalence of caffeine remains important. Additionally, the possibility of other substances being used in energy drink powders, as with the use of DMAA in some gym 'pre-workout' supplements [44] suggests that the normalised consumption of energy supplements may pose further harms beyond excess caffeine consumption.

The performance effects of energy drinks on esport players cognitive abilities were studied in elite league of legends (LOL) players [45]. The study was to examine the cognitive and physical changes associated with consuming energy drinks when playing LOL. However, their findings found that these elite male esport players (n = 9) did not demonstrate any mental or physical improvements in their performance from using energy drinks or the placebo.

Additional work carried out by Ip et al., [46] noted in their sample of 526 participants, they averaged 23.9 years of age and had been playing video games for 17.8 years. The sample noted that 42.6% used a PED for gaming, and the most reported PEDs were licit substances such as caffeine drinks (33%) and energy drinks (19.2%). Six percent of the sample expressed they used prescription medication off-label as a PED for their gaming. From those participants that specifically obtained stimulants, when asked about its effect on their gaming performance, 73% of the sample (19) said that it enhanced their gaming performance.

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Further questioning revealed that many had some form of psychiatric disorder and or significant levels of alcohol consumption. 38.6% binged alcohol, and 12.9% used alcohol heavily. In additional research, Kelly and Van der Leij [36] have identified the rise of alcohol sponsorship now appearing at esports events which may be of concern if there is a high rate of binge–drinking and alcohol abuse going on behind the scenes. Their paper discusses other researchers' work investigating varying levels of PED use in different online gaming events and esports competitions.

The significant investment into marketing and sponsorship for the use of energy drinks within esports has created an environment where there is a high prevalence of these drinks being consumed for a range of reasons. Frias [41] argues that the commercial partnership between esports organisations and energy drinks may impact esports anti-doping underpinnings due to inherently conflicting nature of the two entities. One is for enhancing performance, and the other is for fair play, good sportsmanship and inferring no harm to the athlete's health. However, these energy drinks do have real world effects and have associated health risks which is a concern for public health practitioners [47].

Brainpower: Nootropics and Cognitive Enhancements in Esports

Study drugs can be defined as a substance that "*increases the cognitive ability of anyone taking it, whether the user is cognitively impaired or normal*" [48]. Holm et al., [49] found that in their sample of college students at a midwestern university in America, they used these study drugs not to make up for lack of study habits or poor grades, but rather to augment effective study habits to facilitate their academic performance. Monnet *et al*., [50] in a qualitative study of students in New Zealand found that 'study drugs' were perceived to make consumers feel less tired, more focussed, and better able to manage their time effectively. Significantly, students pointed to peer influence and the perception that the drugs were widespread among students, creating pressure to use them too to stay on the same academic level as peers.

Not only have these drugs been identified within the field of education but also esports, as noted by Ip et al., [46] aforementioned. Within the field of education this is a real concern as many students who use these drugs do so without a prescription [51]. This is due to the widespread belief that using these drugs will enhance their academic performance, though there is little evidence to support this claim. However, there is a real risk from the side effects [52] and misuse of these drugs including psychosis, myocardial infarction and even sudden death [51 & 53].

Does the World Anti-Doping Agency have an Answer?

The regulation of drug use in esports presents a complex challenge that existing bodies such as the Esports Integrity Commission (ESIC) and the World Anti-Doping Agency (WADA) have yet to fully address. While anti-doping measures have strengthened in many esports' genres, there is a perception that stimulant and psychoactive substance use remains prevalent among both elite and recreational players [54]. In non esport populations, off-label use of these drugs is significantly high [55]. These substances, often easily accessible online or over the counter, are commonly used to enhance focus, alertness, and memory, functions critical for competitive gaming [56 – 57]. These drugs are known to be used within higher education and are known as "study drugs" [48] and also known as cognitive enhancers [58]. The widespread use of stimulants in esports raises societal concerns as these substances can lead to dependency, cardiovascular issues, and other severe health complications [59].

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Furthermore, the normalisation of enhancement drug and stimulant use for competitive or cognitive edge perpetuates performance expectations, fostering harmful psychosocial impacts such as anxiety and burnout [60]. This underscores the urgent need for harm reduction approaches that prioritise safety and wellbeing over punitive measures, particularly within the evolving digital doping landscape.

This is where the concept of the digital doping risk environment becomes crucial. Rather than viewing drug use purely as individual behaviour, the risk environment framework [61] situates it within social, economic, and structural factors that shape access and use. In esports, doping has shifted from physical spaces such as gyms into digital arenas, online forums, marketplaces, and communities, where consumers procure substances and exchange knowledge and support. This decentralised, globalised ecosystem facilitates drug use in ways that evade traditional regulation and enforcement [62].

The digital doping environment not only enables access to PEDs but also fosters communities where consumers share lived-living experiences, dosage strategies, and cultural practices [63 - 64] . This complex, interconnected space challenges conventional anti-doping bodies like ESIC and WADA, which were designed to operate within defined physical contexts and competitive structures [65]. Consequently, any effective response to any PED in esports must engage with the realities of the digital risk environment, incorporating harm reduction principles that address structural drivers and prioritise consumer safety. Linking regulation with an understanding of these digital spaces is essential for developing culturally relevant and effective health promotion strategies in the esports landscape.

The Digital Doping Risk Environment

The concept of a *risk environment* offers a critical lens for understanding how individual behaviours, such as PED consumption [66], are shaped by broader social, economic, and structural factors [61 & 67}. Risk environments highlight the interplay between individual agency and the contextual conditions that enable or constrain safer practices [68], shifting the focus from personal responsibility to the environments that produce harm. In the context of doping, these environments are shaped not only by physical spaces—such as gyms or sports institutions—but increasingly by digital arenas where access, practices, and norms are negotiated [66 & 69}. The digital doping ecosystem represents a key dimension of these environments, blending technical, social, and structural elements that both mitigate and amplify risk. The digital doping environment represents a transformative shift in how individuals access, discuss, and navigate PEDs. Once limited to in-person networks like gyms, the ecosystem has expanded into online forums, marketplaces, and communities, creating a decentralised and globalised marketplace for doping.

Since the late 1990s, the rise of the internet has enabled people to bypass traditional gatekeepers, such as gym mentors or in-person suppliers, by accessing a digital ecosystem that connects them to a vast array of PEDs, ranging from anabolic steroids to research chemicals and peptides, as well as stimulants [70 – 72]. Andreasson and Henning [64] have traced this evolution, highlighting how the internet facilitates not only the procurement of drugs but also the exchange of knowledge, advice, and identity formation within diverse doping subcultures [72].

Online forums, marketplaces, and communities now act as hubs for not only drug procurement but also the exchange of information, advice, and support, making it easier than ever for users to navigate the technicalities of drug use and dosage protocols [73 – 74]. These spaces have become integral to modern doping practices, blending the technical with the social as ‘users’ share lived-living experiences, cultural insights, and wellness-oriented goals. These dynamics reflect broader societal shifts in how doping is understood, practiced, and policed in the digital age.

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More than just a marketplace where substances are bought and sold, the online doping environment functions as a dynamic ecosystem shaped by global communication networks and intersecting identities [75]. It incorporates suppliers, consumers, and communities who share diverse motives and goals, ranging from athletic performance to aesthetic enhancements and self-exploration. This ecosystem facilitates identity formation, lifestyle debates, and community building, with discussions often transcending traditional distinctions between recreational and sport-related doping. Gibbs [76] has suggested that digital platforms represent 'the ultimate dopogenic environment' (p.101), through connecting people globally and stimulating desire, as well as spreading awareness and access to these drugs.

This dynamic ecosystem is not confined to traditional doping spheres like bodybuilding or athletics but extends into emerging subcultures and even normative cultural spaces [77], likely consumed by competitors in esports and competitive gaming.

Within these communities, the pursuit of cognitive and reflexive enhancement mirrors the physical optimisation sought in other PED contexts and communities. Gamers engage in digital spaces where stimulants such as Adderall and Ritalin are discussed and procured, valued for their perceived ability to heighten focus, reaction times, and endurance during extended gaming sessions. These forums facilitate knowledge sharing about dosages, effects, and ethical concerns, reframing stimulant use as a strategic tool for competitive success rather than illicit behaviour. The evolution of this online doping ecosystem reflects broader societal trends, including the commercialisation of fitness [76], the normalisation of self-optimisation [77 – 79], and wider cultural shifts toward self-transformation [80 – 81], underscoring the entanglement between digital and physical realms in shaping contemporary drug cultures [82].

Harm Reduction as a Cultural Shift

Harm reduction, as both a philosophy and practice, operates on the principle of meeting people where they are, emphasising pragmatic strategies to reduce the harms associated with drug use without necessarily requiring abstinence [83]. Rooted in public health and human rights frameworks, harm reduction prioritises the safety, dignity, and autonomy of people, particularly in contexts where structural factors and social norms create environments of vulnerability. This approach is especially critical within digital doping ecosystems, where traditional mechanisms of harm mitigation, such as in-person mentorship or institutional oversight, are largely absent. If these environments do not exist then individuals will not speak out and not reach out to healthcare services for help and support which fosters a code of silence [30 & 84].

The digital doping environment presents a distinct set of challenges for harm reduction, as it enables widespread access to stimulants and other PEDs while facilitating the exchange of knowledge that is often unverified, fragmented, or commercially driven [64 & 75]. Within this decentralised and globalised network, harm reduction can serve as a preventative tool by promoting safer practices, fostering informed decision-making, and cultivating cultural norms that prioritise wellbeing alongside performance. For example, in esports, where e-athletes face immense pressure to perform under competitive and financial constraints, the normalisation of stimulant use to enhance focus and reflexes creates significant risks for both health and dependency [85]. Harm reduction strategies could intervene by providing targeted education, peer-led support networks, and accessible resources for safe substance use, tailored to the unique pressures of gaming cultures. Table 1.0 below outlines these strategies

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Table 1.0 Harm Reduction Strategies for Esports

Number	Harm Reduction Strategy	Context and Application
1	***Peer-led online forums and Discord groups***	E-athletes sharing personal experiences with stimulants (like modafinil and Adderall), discussing dosing strategies and side effect management to reduce harms.
2	***Digital harm reduction initiatives providing educational webinars***	Targeted at gaming communities to raise awareness about risks such as cardiovascular strain and anxiety caused by stimulant use.
3	***Anonymous, evidence-based online resources***	Designed to support safer use practices within esports community.
4	***Collaborations with tournament organisers***	Embedding health promotion messages directly into esports competitions to reach players under competitive pressure.

Importantly, we note that framing harm reduction within these environments involves more than just mitigating risks—it requires fostering new cultural practices that challenge the normalisation of doping while acknowledging the realities that drive its use. This could include integrating harm reduction into esports team policies, creating digital platforms for peer-driven guidance, and collaborating with influencers within gaming communities to shift norms around enhancement and self-optimisation.

Additionally, harm reduction efforts must contend with the anonymity and international reach of digital spaces, which complicate traditional interventions but also offer opportunities for innovative, scalable solutions. By embedding harm reduction as a cultural preventive philosophy within esports and broader digital doping cultures, it becomes possible to address the interplay between individual agency and systemic pressures, fostering safer, more sustainable approaches to enhancement in these evolving risk environments.

Existing works on PED use within bodybuilding communities have noted the role that trusted community members could play in working with academics and public health professionals to disseminate evidence-based advice on safe use and harm reduction [72 & 86], reducing barriers such as stigma that may otherwise lead to a reliance on poor quality information rather than reach out to healthcare or other professionals [84]. Esports communities could look to adopt similar policies, leveraging embedded cultural insiders with an interest in re-orienting spaces towards a harm reduction philosophy.

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Challenges and Recommendations for Esport Organisations

The biggest challenges within esports will be a) Issues with Sponsorships and b) Harm reduction programmes that can co-exist with anti-doping. Finally, c) Funding and resources.

- As outlined by Lopez Frias [38], there could be an issue with promoting an energy drink that may be linked with causing harm for some esport players. This may lead to a negative brand image, reduced exposure and revenue, or, worst case, the sponsors pulling out entirely. To counter this, the energy drink sponsors should run a "drinks aware campaign" like how the alcohol companies do to educate their customers more and offer educational support if they are concerned with the product.

- The concern with running a harm reduction program is that it will conflict with an anti-doping program as the two may be perceived as opposing perspectives. Anti-doping programs want to eliminate drug use within sporting events, yet the World Anti–Doping Agency (WADA) and subdivisions have still failed to achieve this aim with doping across all sports. Many have questioned the effectiveness of WADA as it has not reduced the prevalence of doping [87]. Harm reduction programs are aware they cannot eliminate all drug use, yet they will help reduce harmful practices to the individual and supply them with better alternatives for their lifestyle to reduce harm to the individual.

Furthermore, since these drugs are not always illegal to get and many esports events do not have drug testing, this may be the most practical way to reduce the prevalence and serious harm to participants. At the same time, educating the fans and teams on the risks associated with using them and other harmful habits such as alcohol abuse is likely to reduce harms, fulfilling at least one aim of anti-doping's philosophy.

- Finally, the cost and scale of resources to accurately and effectively run a successful harm reduction program may require significant funding. A whole systems approach is needed that includes esports teams, governing bodies, universities, harm reduction services and mental health services to ensure a holistic approach to support those individuals engaging in harmful health behaviours. This will entail counsellors, mental health training for teams and fans, event programs, awareness and marketing campaigns, and dedicated staff running services and programs to link with referral services to ensure those at risk get the best possible treatment.

However, in the interim the possibility of leveraging willing community participants, as outlined above, is likely to be a beneficial first step towards implementing some form of evidence-based harm reduction in esports communities.

Conclusion

From the research identified, there is an omission of literature to assess any anti-doping intervention or educational training on esport or video gamers regarding the use of PEDs. Furthermore, this has also highlighted the potential issues of running an educational program to tackle the risk factors and adverse health outcomes of using these drugs if they are linked with sponsors such as energy drinks which are normalised as part of the video game landscape and when cheating and the sue of these drugs is becoming popularised. Yet, there is an opportunity for practitioners and coaches to promote a harm reduction approach through educational pathways such as colleges and universities to help reduce the risk of their athletes using these drugs especially when their online environments are discussing, promoting and offering opportunities to source these drugs which is similar to online communities sourcing IPEDs. By focusing on harm reduction interventions, this will not only promote and align with anti-doping values, but more importantly, it will educate and help students and e–athletes to come forward for support if they are self–medicating themselves for academic and or esport performance reasons.

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Conflict of Interest

The authors can declare that they have no conflict of interests when writing this manuscript.

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